New laser lab shows fastest physical processes known

May 2 2006

The University of Reading has developed a laser laboratory that is capable of showing some of the fastest physical processes known. The Ultrafast Laser Laboratory (ULL) can generate high energy laser light pulses with durations less than one tenth of a millionth of a millionth of a second long. The spectral range available ultimately covers the electromagnetic spectrum from TeraHertz to Vacuum Ultraviolet. The pulses can be tailored to have a particular shape and their properties can be measured.

The Department of Physics and the School of Systems Engineering at the University received funding from the Science Research Investment Fund for the project. This state of the art facility took nearly two years to design and build and now contains an impressive suite of recently developed instruments.

The laser pulses created in the ULL have a wide range of functions and will be used to investigate theories in fundamental physics as well as practical applications in medical science, DNA sequencing and even to discover more about the composition of archaeological finds.

Dr Sean O'Leary, Laboratory Manager of the ULL, said: "More than twenty potential research projects using the ULL have been proposed so far, in collaboration with other groups within the University, with local companies and with medical physicists at the Royal Berkshire Hospital. Members of the Department of Systems Engineering at the University are using the lasers to develop new sources of light waves in the

‘Terahertz gap’ – the last unconquered region of the electromagnetic spectrum.

"The lab is also being used in conjunction with Imperial College London to test our understanding of molecular quantum theory. This is a very exciting field of research at the very forefront of our scientific knowledge. We will be producing and using some of the shortest light pulses in the world, right here at Reading."

As well as being used for research, the facility will be a valuable teaching aid, as students at the University are already taking part in projects on the very limits of scientific understanding.

Source: University of Reading